

Three new species of *Porterandia* (Rubiaceae) from Mount Kinabalu, Borneo

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Abstract

Three new species of *Porterandia* (Rubiaceae), *P. beamanii*, *P. chanii* and *P. puffii*, which occur on Mount Kinabalu, Borneo, are described.

Introduction

In the earlier enumerations of plants on Mount Kinabalu, Stapf (1894) and Gibbs (1914) did not list any species that could be identified as *Porterandia*, a genus described by Ridley in 1939. As material accumulated, the Bornean taxa were wrongly named *Porterandia anisophylla* from Peninsular Malaysia and Sumatra in herbarium identification. A revision of the genus has been carried out at the University of Malaya, where a number of new species have been recognized for Borneo. These include three undescribed species from Mount Kinabalu. The new species are described here in anticipation of the forthcoming Volume 5 of *The Plants of Mount Kinabalu* by Professor John Beaman's team. A full revision of *Porterandia*, consisting of 22 species in all, will be published subsequently.

The new species

1. *Porterandia beamanii* MS Zahid, sp. nov.

Fig. 1

Porterandiae minori Ridl. *similis sed foliis typice minoribus (ad 5-6 cm latis) lobisque calycis florum femineorum foliaceis in statu fructifero differt.* **Typus:** Pereira et al. JTP 144 Sabah, Tambunan, road to Trusmadi, lower montane forest, 1180 m (9 Mar 1995, fruiting) (holotypus SAN!, isotypus SING).

Gynodioecious or possibly gynomonoeious trees, to 35 m high, to 25 cm diameter, not buttressed. Bark smooth to slightly fissured to grid-cracked; pale brown to dark brown. Shoot tips, distal branch internodes, petioles and leaf veins with erect-suberect

hairs. Stipules ovate-triangular and fused along the edges to form a tube, 1–1.5 cm long, densely hairy. Mature **leaves** with petiole (0.4–)0.5–1.5(–2) cm long, 1–3 mm thick; lamina usually elliptic, rarely obovate, 8–20.5 cm long, 3–6(–8.5) cm wide; leaf base cuneate; leaf apex acute to acuminate to short-caudate; when dry chartaceous; secondary veins 9–15 pairs, on upper side flattened to slightly raised, on lower side distinctly prominent; tertiary venation a much-branched network between pairs of secondary veins.

Bisexual inflorescences: Peduncle 0.2–0.6 cm long; habit compact, with 1–2 distinct branching orders. Flowers 5–21 per cyme, usually in 1–3 clusters; pedicels 1–3 mm long, 1.5–2 mm thick; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes short to narrow-triangular to linear, often also spatulate becoming foliaceous in fruit, 2.5–7 mm long; corolla hypocrateriform, the tube 5–8 mm long, 2–3 mm wide at the throat, with a slightly to conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes ovate to narrowly elliptic, 4–5 mm long; anthers 4–5 mm long, with pollen; style 4–5 mm long, stigma 1–2 mm long. **Female inflorescences:** Peduncle 0.2–0.7 cm long; habit sparsely branched, with 1 distinct branching order. Flowers 1–3 per cyme; pedicels 2–3 mm long, 1.5–2 mm thick; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes narrowly triangular to linear to spatulate becoming foliaceous in fruit, 3–8 mm long; corolla hypocrateriform, the tube 5–9 mm long, 2–3 mm wide at the throat, with a slightly inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes narrowly elliptic to ovate, 4–5 mm long; anthers 4–5 mm long, without pollen; style 4–5 mm long, stigma 3–4 mm long. **Fruit** sub-globose to ellipsoid, 2–3.5 cm long, 2–3 cm wide, short-tomentose when young, becoming glabrous. Seeds flattened, lens-shaped to rounded, 4–6 mm x 5–7 mm, testa surface finely areolate.

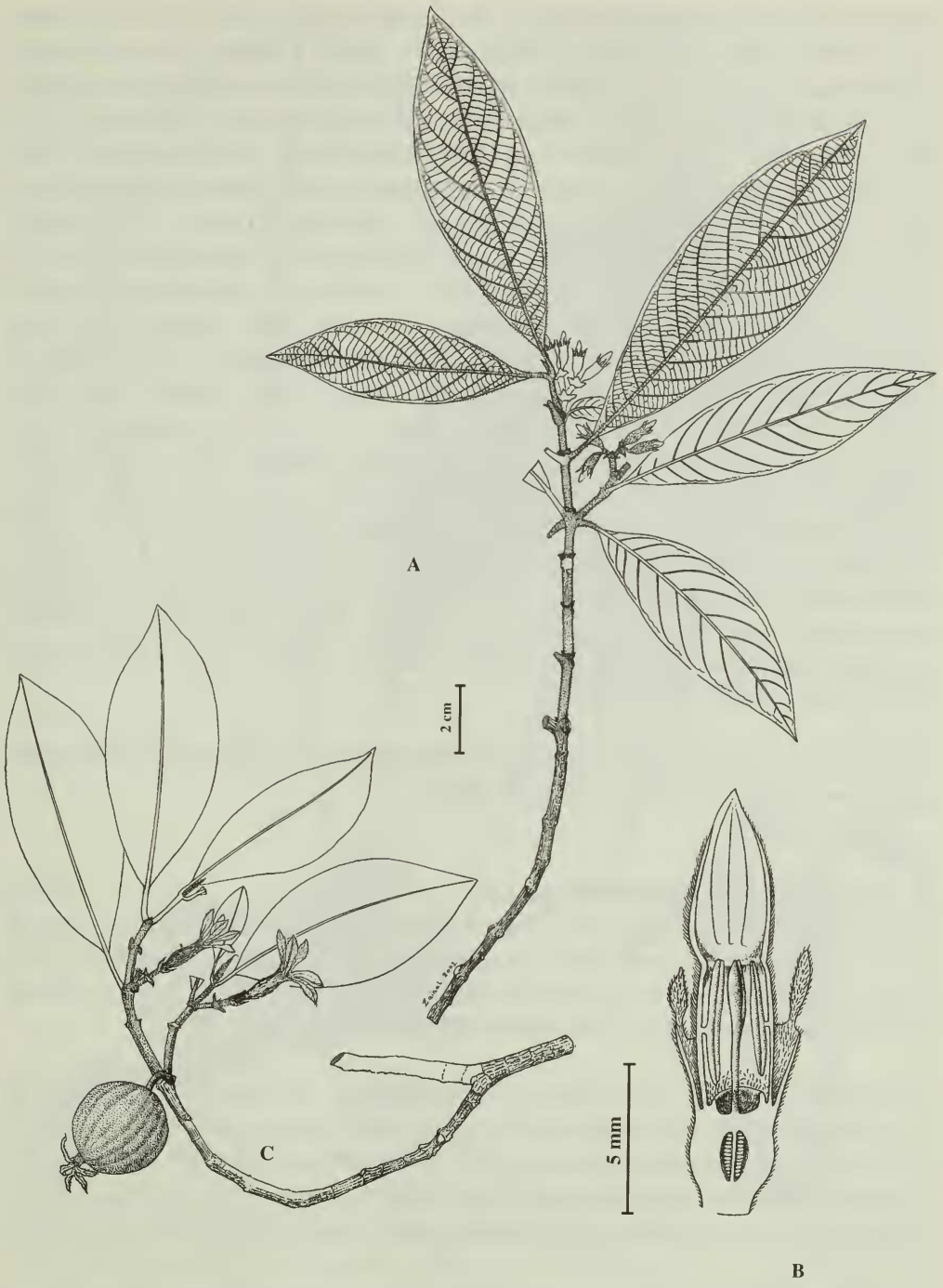
Notes: Bisexual and female cymes can occur together on the same branch (*Ampuria* SAN 32690).

Distribution: Borneo, so far known only from Sabah (including Mt Kinabalu and the Crocker Range) and Sarawak, in lower montane forest at 3700–6000 ft [1147–1860 m] elevation.

Specimens Examined: BORNEO. SABAH: Ranau, Kundasang, 4300 ft [1333 m], Singh SAN 28254, 10 Nov 1961, female inflorescences (BO! L!), bisexual inflorescences

Figure 1. *Porterandia beamanii*. **A**, leafy branch with bisexual inflorescences. **B**, bisexual flower, longitudinal section. **C**, leafy female fruiting branch. Note foliaceous calyx lobes in B and C.

A from *Pereira JTP 141* (SAN), B from *Singh SAN 28254* (SAR) and C from *Pereira JTP 144* (SAN).



(KEP! SAN! SAR!), Kinabalu National Park headquarters, 5300 ft [1643 m], *Aban SAN 57718*, 13 Mar 1967, fruiting (KEP! SAN!), Mount Kinabalu, Ulu Liwagu and Ulu Mesilau, *Chew, Corner & Stainton RSNB 2661*, 2 Apr 1961, female inflorescences (K! L!), trail from Kiau Nulu to Marai Parai, near Tohubang River, 3700 ft [1147 m], *Wong WKM 2366*, 12 Sep 1993, fruiting (KEP! SAN! SING), Penibukan, 4000–5000 ft [1240–1550 m], *Clemens & Clemens 30492*, 28 Dec 1932, bisexual inflorescences (K! L! SING), Gurulau Spur, 6000 ft [1860 m], *Clemens & Clemens 50573*, 30 Nov 1933, female inflorescences (K! L!); Ranau, Tenompok FR, *Wong WKM 2876*, 30 Aug 2001, female inflorescences (KLU! SAN!); Tambunan, Crocker Range, Km 62.5 on Kota Kinabalu–Tambunan road, *Beaman 7183*, 9 Oct 1983, fruiting (L!), road to Trusmadi, 1180 m, *Pereira et al. JTP 141*, bisexual inflorescences (SAN! SING) & *JTP 144*, 9 Mar 1995, fruiting (holotype SAN! isotype SING), Mount Trus Madi, 1200 m, *Nooteboom 1451*, 20 Mar 1969, fruiting (L! SAN!); Penampang, Crocker Range, Km 51.8 on Kota Kinabalu–Tambunan road, *Beaman 8945*, 16 Mar 1984, fruiting (L!); Keningau, Ulu Sg Tinagalan FR, *Fidilis & Asik SAN 113143*, 22 Nov 1985, bisexual inflorescences (KEP! SAN!); Sandakan, Mamahat Camp, K.F.L, 4000 ft [1240 m], *Ampuria SAN 32690*, 1 Dec 1962, female inflorescences (L!), bisexual inflorescences (KEP!). SARAWAK: 4th Division, proposed Gunung Murud National Park, along Sungai Taramusu, 1500 m, *Yii S 44635*, 14 Sep 1982, fruiting (K! KEP! L!), Kapit, Melinau, Ulu Sumpurau, Bukit Sampadai, 1433 m, *Ilias S 40721*, 6 Apr 1980, fruiting (KEP! SAN! SAR!).

This species is named after Professor John Beaman, who is well known for his work on the enumeration of Mount Kinabalu plants.

2. *Porterandia chanii* MS Zahid, sp. nov.

Fig. 2

Porterandiae anisophyllae (Jack ex Roxb.) Ridl. *similis sed limbo calycis sparsim piloso et tubo corollae tecto pilis sursum directis differt.* **Typus:** Singh SAN 34727 Sabah, Sandakan, along north boundary Sepilok FR (1 May 1962, bisexual inflorescences) (holotypus SAN! isotypi BO! L! SAR! SING).

Gynodioecious tree, to 16 m high, to 18 cm diameter, not buttressed. Bark smooth with transverse lenticels to slight grid-cracked; pale brown to dark grey. Shoot tips, distal branch internodes, petioles and leaf veins with erect-suberect hairs. Stipules ovate-triangular and fused along the edges to form a tube, 1.5–2 cm long, sparse to densely hairy. Mature **leaves** (not immature leaves near the shoot-tips) with petiole

Figure 2. *Porterandia chanii*. **A.** leafy branch with bisexual inflorescences. **B.** mature bisexual flower, longitudinal section. Note very sparsely hairy calyx.

A from Singh SAN 34727 (L), B from Agama A 525 (K).



1–2.5(–3) cm long, 1–4 mm thick; lamina mostly obovate to elliptic, 16–42 cm long, 8–19 cm wide; leaf base cuneate; leaf apex acute to obtuse to caudate; when dry chartaceous; secondary veins 16–21 pairs, on upper side flattened to slightly raised, on lower side distinctly prominent; tertiary venation a much-branched network between pairs of secondary veins.

Bisexual inflorescences: Peduncle 0.3–0.6 cm long; habit laxly branched, rarely compact, with 4–5(–8) distinct branching orders. Flowers 12–34(–45) per cyme, usually in 1–3 clusters; pedicels 3–6 mm long, about 1 mm thick; calyx tube/limb sparsely covered by hairs (much of calyx surface visible); calyx lobes triangular to linear, 0.5–2 mm long; corolla hypocrateriform, the tube 11–15 mm long, 3–4 mm wide at the throat, without any conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes narrowly elliptic to ovate, 7–10 mm long; anthers 5–6 mm long, with pollen; style 8–10 mm long, stigma 3–4 mm long. **Female inflorescences:** Peduncle 0.3–0.7 cm long; habit sparsely branched, with 2(–3) distinct branching orders. Flowers 5–12 per cyme; pedicels 3–7 mm long, 1–2 mm thick; calyx tube/limb sparsely covered by hairs (much of calyx surface visible); calyx lobes triangular to linear, 0.5–2 mm long; corolla hypocrateriform, the tube 10–12 mm long, 2–4 mm wide at the throat, without any conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes narrowly elliptic to ovate, 7–9 mm long; anthers 3–4 mm long, without pollen; style 7–8 mm long, stigma 3–4 mm long. **Fruit** sub-globose to ellipsoid, 3–4 cm long, 3–3.5 cm wide, sparsely hairy when young, becoming glabrous. Seeds flattened, lens-shaped to rounded, 3–5 mm \times 3–7 mm, testa surface finely areolate.

Distribution: North and northeast Borneo, in the Sabah-Tarakan region, in primary and disturbed lowland forest, c. 100–1800 ft [30–560 m].

Specimens Examined: BORNEO. SABAH: Kudat, Bandau, Tagabu F.R., 1800 ft [558 m], *Mait & Anthony* SAN 37667, 16 Oct 1963, fruiting (SAN!); Kota Belud, Bukit Matindok, 1000 ft [310 m], *Lajangah* SAN 32158, 3 Oct 1962, female inflorescences (SAR!), bisexual inflorescences (BO! KEP! SAN!); Kota Marudu, Marak-Parak, Ag. Amin & Mancus SAN 118990, 1 Apr 1987, fruiting (KEP! SAN!); Ranau, west of Kg. Nabutan, *Aban* SAN 94542, 22 Mar 1982, fruiting (KEP! SAN!), Kinabalu, Kg. Melangkap Tamis, Sg. Kepungit, *Lorence* LL 669, 4 Jul 1995, fruiting (KEP! SAN!); Tenom, Crocker Range FR, *Aban* SAN 66787, 18 Apr 1970, bisexual inflorescences (K! L! SAR! SING); Nabawan, Sg. Millian, *Sumbing* SAN 118626, 12 Nov 1986, bisexual inflorescences (SAN!); Sipitang, near Mt. Muruk Miau, *Pius & Soinin* SAN 143167, 13 Apr 2000, fruiting (SAN!); Sandakan, Kabili F.R., compt. 14,

Agama A 525, 21 Oct 1947, bisexual inflorescences (BKF! K! KEP!), along north boundary of Sepilok F.R., *Singh SAN 34727*, 1 May 1962, bisexual inflorescences (holotype SAN! isotypes BO! KEP! L! SAR!); Kinabatangan, Bukit Mansuli, 200 ft [62 m], *John & Markus SAN 144631*, 16 May 2002, bisexual inflorescences (KLU! SAN!); Lahad Datu, Danum Valley, plot 1, *Campbell SAN 112095*, 12 Jun 1986, fruiting (SAN!); Tawau, east of Sg. Serudong, 100 ft [31 m], *Bakar SAN 26154*, 6 Sep 1961, fruiting (SAN!); Kalabakan, Gunung Tembuku, *Fedilis & Sumbing SAN 91472*, 8 Mar 1980, fruiting (KEP! SAN!). KALIMANTAN: Nunukan Island, 30 m, *Kostermans 9182*, 31 Dec 1953, bisexual inflorescences (K! L!).

This species commemorates Datuk C.L. Chan, who has provided field support for my study of this genus and much encouragement in my learning of Bornean botany.

3. *Porterandia puffii* MS Zahid, **sp. nov.**

Fig. 3

Porterandiae scortechinii (King & Gamble) Ridl. *similis sed limbo calycis sparsim tecto pilis brevibus, lobis calycis linearibus 1/3 to 1/2 logitudine limbi calycis, et tubo corollae tecto pilis sursum directis differt.* **Typus:** Clemens & Clemens 33834 Sabah, Mount Kinabalu, Colombon River (Jun 1933, bisexual inflorescences) (holotypus L! isotypus K!).

Gynodioecious tree, to 15 m high, to 16 cm diameter, not buttressed. Bark grid-cracked; greyish white. Shoot tips, distal branch internodes, petioles and leaf veins with sparse appressed hairs. Stipules ovate-triangular and fused along the edges to form a tube, 0.6–1.5 cm long, sparsely hairy. Mature **leaves** (not immature leaves near the shoot-tips) with petiole 1–2.3 cm long, 1–1.5 mm thick; lamina mostly obovate to elliptic, 10.5–15(–19) cm long, 4.5–7(–10.5) cm wide; leaf base cuneate; leaf apex broadly acute to obtuse with a short point; when dry chartaceous; secondary veins 10–15 pairs, on upper side flattened to slightly raised, on lower side distinctly prominent; tertiary venation a much-branched network between pairs of secondary veins.

Bisexual inflorescences: Peduncle 0.2–0.3 cm long; habit compact, with 1–2 distinct branching orders. Flowers (2–)6–10 per cyme, usually in 1–2 clusters; pedicels 3–6 mm long, 1–1.5 mm thick; calyx tube/limb sparsely covered by hairs (much of calyx surface visible); calyx lobes narrow and linear, 2–5 mm long; corolla hypocrateriform, the tube 8–12 mm long, 4–5 mm wide at the throat, with a conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes ovate-elliptic, 6–9 mm long; anthers 5–6 mm long, with pollen; style 4–6 mm long, stigma 4–5 mm long. **Female inflorescences** (in young flower-bud stage): Peduncle 0.1–0.3 cm long; habit unbranched. Flowers 1 per cyme; pedicel 3–5 mm long, 1–1.5 mm thick; calyx tube/limb sparsely covered by hairs (much of calyx surface visible); calyx lobes narrowly triangular, 2–4 mm long; corolla hypocrateriform,

the tube with a conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes ovate-elliptic; anthers not known. **Fruit** sub-globose to ellipsoid, 2.7–4.8 cm long, 2.6–4.5 cm wide, sparsely hairy when young, becoming glabrous. Seeds flattened, lens-shaped to rounded, 5–6 mm x 6–8 mm, testa surface finely areolate.

Distribution: Sabah (on Mount Kinabalu and the Crocker Range) and Sarawak, in lower montane to mossy forest, c. 5000–6560 ft [1550–2000 m].

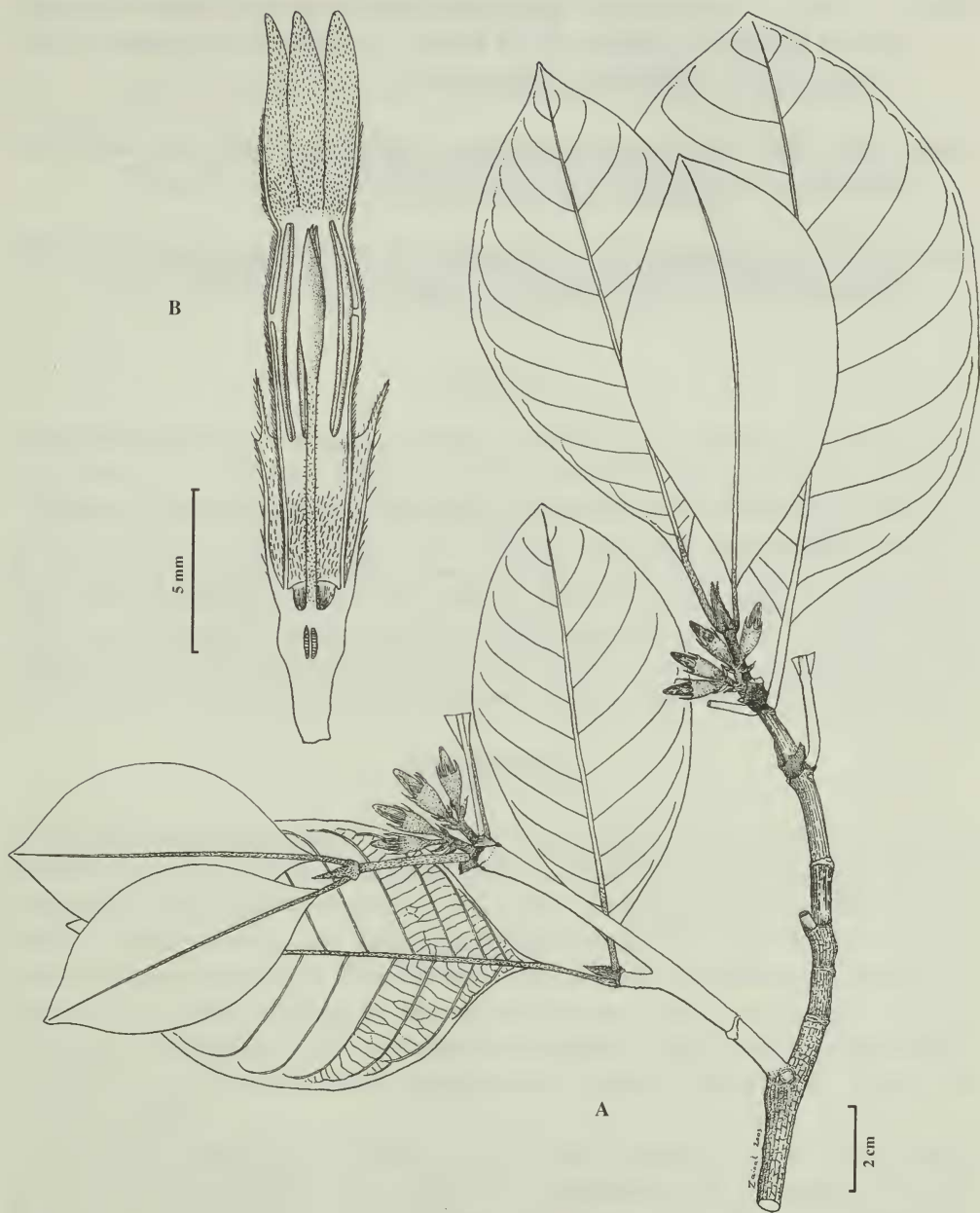
Specimens Examined: BORNEO. SABAH: Ranau, mile 35 Ranau road, 5000 ft [1550 m], *Aban SAN 57767*, 10 May 1967, bisexual inflorescences (KEP! SAN!), Mount Kinabalu, Mesilau River, *Chew & Corner RSNB 4873*, 8 Apr 1964, fruiting (K! L!), Colombon River, *Clemens & Clemens 33834*, Jun 1933, bisexual inflorescences (holotype L! isotype K!), 1 mile north of Tenompok on path to Lumu Lumu, *Wood A 4463*, 18 Jul 1954, bisexual inflorescences (L!); Tambunan, road to G. Alab, *Pereira et al. JTP 118*, 3 Mar 1995, female inflorescences (SAN!). SARAWAK: 4th Division, Kelabit Highland, summit of Apad Runan, 2000 m, *Yi S 56231*, 10 May 1988, bisexual inflorescences (SAN!).

This species is named for Professor Christian Puff, whose work on the Rubiaceae is well known and who has given much help and encouragement to my own studies.

Acknowledgements

I thank the Keepers and Curators of the herbaria at the Herbarium Bogoriense (BO), Kew (K), Forest Research Institute Malaysia at Kepong (KEP), University of Malaya (KLU), Leiden (L), Forest Research Centre, Sandakan (SAN), Forest Research Centre, Sarawak (SAR) and the Royal Forest Department, Thailand (BKF) for loans of material for study. Dr. Y.F. Lee and Ms. Joan Pereira of the Forest Research Centre, Sandakan and Datuk C.L. Chan kindly provided logistic support during my fieldwork. Dr. R.C.K. Chung of the Forest Research Institute Malaysia assisted while at KEP. Professor A.L. Lim and Dr. K.M. Wong (University of Malaya) provided much guidance, advice and encouragement in the preparation of this paper. Professor Christian Puff of the Institute of Botany, University of Vienna provided helpful suggestions and the Latin diagnoses. This paper results from an M.Sc. programme at the Faculty of Science, University of Malaya, and was supported in part by the Malaysian IRPA Project No. 09-02-03-0090-EA090.

Figure 3. *Porterandia puffii*. **A**, leafy branch with bisexual inflorescences. **B**, bisexual flower, longitudinal section. Note sparse appressed hairs on petioles and leaf veins.
A from *Clemens & Clemens 33834* (L), B from *Wood A 4463* (L).



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